element is sufficiently separated from other conductive members, as shown in FIG. 4, as the frequency of an input signal becomes high, the forward gain becomes smaller. This is because the fact that the impedance of the inductor element having the predetermined inductance L is jωL and becomes large in proportion to the frequency of the input signal.

On the other hand, as shown in FIG. 5, in the state that this inductor element is closely contacted to the copper plate, it is possible to maintain a high forward gain even if the input signal changes. This shows that this inductor element does not function as an original inductor since the inductance that this inductor element has becomes small by bringing the copper plate close to this inductor element. An estimated cause of decreasing the inductance is that eddy currents arise on the front side of the copper plate owing to magnetic flux, which is generated when a signal is inputted into the electrode, and cancel this magnetic flux.

In addition, in the measurement described above, although the copper plate was used as a substrate, even in the case that a semiconductor substrate is used instead of the copper plate, the same phenomenon happens fundamentally.

FIG. 6 is a graph showing the measurement result of the forward gain of an inductor element having two layers of electrodes that have the same shape and arrangement as the two conductors 1 and 2 included in the inductor element 10. In addition, FIG. 7 shows the forward gain of an inductor element having two layers of electrodes that have the same shape and arrangement as the two conductors 1 and 2 included in the inductor element 10, at the time of closely contacting a conductor substrate to this inductor element.